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# Social Network in Education: a Mathematical pilot test.

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**Abstract**

Nowadays the use of ICT technologies, and more specifically computers, is increasingly fast in all activities. Connected to the increase use of new technologies is also the use of social networks. New forms of connection spread among the internet, occupying an empty space of the web and also significant time of youngsters, becoming a daily routine for all of them. The network communication triggered a considerable advance in social behaviour, and originated several social networks. Examples are Facebook, Twitter, Hi5, Orkut and others, some of these increased rapidly and remain nowadays, other succumbed to the natural evolution. Following Marteleto (2001), these networks are characterized as being social structures composed of persons or organizations, connected by one or more types of relationships that share common goals and values.
Over the past few decades the Education began to look for new technologies as a tool to be used in order to improve the teaching process. We are now faced with another major challenge, the evolution and exponential growth of social networks around the web.
New questions arise:

- Social networks may be one more step on the staircase of using new technologies in teaching and learning process?
- Do these can be useful tools to achieve the proposed objectives, as well the creation of rich moments of learning?

In this article we intend to expose, through our experience of using a social network, in the specific case Facebook, what can be done within the framework of a subject at university level. We analyse what we call the Hybrid Model Guide (HMG) of a subject. This hybrid model makes the connection between the contents of a subject and how they can complement and associate with the creation of open or closed group within Facebook.


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## 1. Introduction

It is our understanding that education must be aware of changes in terms of what nowadays is defined as being the Web 2.0. As Patrício and Gonçalves (2010) say, the Web 2.0 tools, like social networks, provide many opportunities for creating a learning environment effective, efficient and engaging. Innovation, collaboration, interaction, sharing, pro-activity, participation, critical thinking and reflective, are some of the advantages of using Web 2.0 in educational settings.

Other important thing is the integration of social networks with tablets and cell phones as it is say in Educause (2007), the ability to browse the site or upload photos from a phone and communicate with the site through text messages - moves the notion of social networking away from computers and into the realm of an "always on" application. This is an important step forward to the possibility of being in touch with education everywhere. So clearly, there are several aspects that we need to discuss considering the use of social networks, in our case, Facebook, some positive and others not. After we consider these aspects in a practical case, we will give our personal opinion regarding the use of a social network in education, however the reader may draw his own conclusions from this exposure and use as he like the framework develop by the authors.

## 2. Proportional Evolution: Education and Society

The last few years have been really significant in terms of technological evolution of our society.

The teaching-learning process was, over time, mutating, evolving, adapting, and always considering the changes occurred in contemporary society. Teaching, generally, reflects the society, but, in a particular way, the teaching process presents the individuals *modus operandi* that live in this society and the available resources.

Teaching in any room whatever the content, Mathematics, Languages or even Sciences, it is not a process that should always follow the same guidelines or be a part of structural or contents changes, given the important changes observed in recent years in this regard. The emergence of computers and other more recent technological tools, as smartphones and tablets, pave the way for a world so vast and diverse, presenting fruitful possibilities of acquiring information and other situations that belong to a dimension more futile, regarding the veracity of the subject observed. One of the major implications of the rapid development of these instruments was the enlargement of the normal context of what is a classroom. Defining classroom could be more difficult than before, because this is not the only place educator must have as exclusive to teaching-learning process: nowadays, it should be given the chance to the students to have access also at home, or anywhere, to direct support by the educator and even by their own colleagues.

Aware of this trend, educators were adapting. Initially, somewhat slow, just using the computer for smaller jobs; more recently, the exploration of internet connections and, as a consequence, the use of resources obtained

through this means. As such, in this vast ocean of knowledge accumulated, it becomes essential to understand the possible choices for a better understanding, so that subsequently we can better understand what to do and how to do it.

Introducing the specific area of mathematics, there are many available software, author or freeware, however, the vast majority have closed structures. Other possibilities such as dynamic geometry software, intend primarily for the specific area of geometry, either in 2 or 3 dimensions, presenting itself, therefore, as a tool with a single objective, i.e., reductive. Nowadays, saying that it is possible to teach differently in a math class is complicated and does not truly defines "differently", because there are few changes from a normal process of teaching. Besides these factors, there is another, probably the most important: the interaction of the student with this kind of technology and software. Students are not always motivated to work with these tools, making this a key aspect for the presentation of new technologies in the context of the teaching-learning process. The motivation, essential, whether in a traditional classroom exposure of content, either in a class that makes use of the technological elements, it is imperative factor for success.

In recent years, there has been an enormous increasing in the use of social networks by learners of all ages and not only. Numerous sites on the Internet were presented, and some succumbed to the same speed that appeared while others resist and continue to reinvent themselves to the rhythm of society and its demands.

Given these innovations, the need arises: teachers have to question themselves as educators of future active citizens about what kind of changes can, and should, be done in the teaching-learning process, inside and outside the classroom (physical), so that it can quickly integrate the web technology in which society is intertwined:

- What will be the primary concern of the use of social networks in the teaching process?
- It makes sense to use this in the context of formal classroom and beyond?
- When can social networks be used in the process of teaching?
- How can it be used?
- What are the advantages and disadvantages that can be identified before and after using it?

Regardless of the resources or tools used in the teaching-learning process, since the sheet of paper up to the latest technologies, the teacher should focus primarily on the student. That is a teacher main function: to be the link between student and knowledge, keeping the students interested and awakening them to the importance of knowledge.

If we consider the process of teaching as a scheme, we can say that the teacher should seek the point equidistant between himself, students and knowledge. (cf. Figure 1).

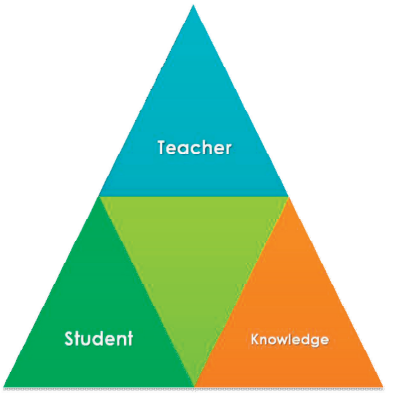


**Figure 1 –** Teaching Process

Of course this demand is not static and is always dependent on the society's ebb and flow in the search of progress. Educators should therefore incorporate in this scheme new tools and processes that society offers.

But sometimes changes to the normal processes of teaching and learning, which are already rooted and embedded within the educational community, are difficult to realize and fully fit. Tools such as social networks can bring something new in the process of teaching and learning, not only in terms of knowledge transfer, but as a motivational tool for the student.

The motivation for teaching and learning these days is a daunting task for the teacher. He is required to fight a battle with panoply of distractions constantly entering the environment of the classroom. This way, the observation of the group or student in particular presents itself as a fundamental initial step in the activity of the educator. The interests of the group of learners can be combined with the motivation process and therefore important to the process of teaching and learning. Having as a starting point a particular interest, as the taste for a particular content or use a known and appealing way, that is part of its range of entertainment activities daily, such as social networks, to address or consolidate new concepts, will make the student feel more integrated and predisposed to participate in the activities that are proposed.

In this way, and relying on recent studies in Portugal (WIP, 2010) and that can easily serve as a guide for other countries, we find that a large number of students use and interact with social networks.

According to the study, 63% of the Portuguese population between 15 and 34 use the internet. Thus, in any of social networking sites analysed users with quantitatively higher expression are the youngest and, conversely, the number of users is more restricted in the older age group. It is possible to say that in sites like MySpace (51% of users in this age group) and Twitter (50%), half of the users are under the age of 25 years. The Hi5 and Facebook have less than half of users under the age of 25 years, but still a strong representation of this age group (45.8%

and 42.3%, respectively). Orkut is the social network with greater presence, in relative terms, of subjects aged 25 or more. In this network, there is closeness between the numerical ranking of 15 to 24 years (37.5%) and the next phase - 25 to 34 (31.3%), as it is possible to see in the table below (cf. Table 1).


**Table 1** – Social Networks in which people have created profile (WIP, 2010)

Analysing these data, given the increasingly high use of social networks by students, it seemed pertinent to authors to present a model that could be consistent with this reality: the use of social network integrated in the model of teaching and curricular structure of a subject.

Thus emerged what the authors called Hybrid Model Guide (HMG), in an attempt to present another possible bridge between the student and the knowledge.

## 3. Defining HMG

The main idea was to motivate students through virtual networks available on the internet where they are already fully integrated, having with it a constant daily connection. In this way, the authors recommend the use of tools that are part of the normal daily tasks of students but with disparate features of what is already known and currently used in educational. The fact that the vast majority of students has smartphones and computers with internet connection makes the student a constant element of the virtual world that surrounds and absorbs us.

The HMG is a model that seeks, as already noted, the link between the student and the knowledge in a more natural way, as demanded by the contemporary society. It consists in the access to information/knowledge through social networks, widely used tool by students of different age groups.

Before clarifying the *modus operandi* of this model, it is important to define what usually we call as a social network.

*A social network is a social structure consisting of individuals or organizations, connected by one or more types of relationships, which share common values and goals. One of the key features in the definition of networks is their openness and porosity, allowing horizontal and non-hierarchical relationships among participants. For being a social connection, the fundamental connection between people occurs through identity. The boundaries of networks are not boundaries of separation but boundaries of identity. It is not a physical limit, but a limit of expectations, trust and loyalty, which is permanently maintained and renegotiated by the communications network. Online social networks can operate at different levels, for example, social networks,* which are the most important for this study. (consulted in http://pt.wikipedia.org/wiki/Rede_social, October, 15th, 16h58m).

This way, the authors defend the use of a social network which presents itself as a transversal way of learning (cf. Figure 2).

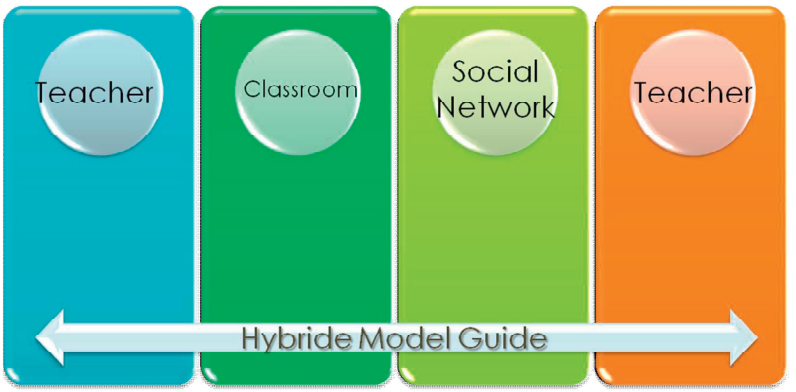


**Figure 2** – Hybrid Model Guide

This figure clarifies HMG and its essential elements: the teacher, the classroom, the social network and the student. None of this elements can be put aside of this methodology, or else it would not make sense.

The teacher continues as a fundamental and indispensable element in the process. It stills belong to him mediating role. The classes, represented here by "classroom", ensure to the process its socializing dimension and explain the feature "hybrid" of this model, i.e., it is not presented as a reductive entity, focusing only on lessons in the classroom but extending them through new processes and means, in this case, the social networks. The social networks, interest focus of the students show up as an asset on the teacher-student relationship, being one more common point between the two, in which the student feels particularly comfortable.

The normal discipline curriculum is defined trough subjects and areas divided separately. Each one of them will provide the student specific objectives and competences. So our idea was to use a social network (Facebook) during a semester in a discipline, defining goals along the subjects. Every week the teacher gives some practical exercises and other type of information in a close group created for the effect. This kind of work was not considered by the students as homework in the normal way. So most of them usually give answers and comment to the questions that were putted in the area without afraid of being wrong or someway giving an answer that were not so correct. One interesting part of this, since the group it's all the time open for answers and questions at any hour during the day and night, was that when the teacher goes to check regularly what is going on, some students already give their own idea about the answer of their colleagues. Sometimes trying to correct, or explaining why they think it's wrong, stating their opinion. Other times giving examples that deny the colleagues affirmations. In mathematics, for example, this kind of thinking it's very important, the counterexample. Using a social network could also create situations that teacher uses to explain some concepts. The classroom it's supple by the outside effects and vice-versa, so the regular use of a social network during the semester could prolong the classroom space. Off course the role of the teacher it's still very important, checking the answers and acting as a coordinator of all the process. As we said before, the teachers still have a great importance in the overall process. His knowledge is still the most important part of all situations that are created during the use of the social network.

The evaluation of this situations its easy configure, the teacher that follows the works done in the close group can evaluate the efforts that students do along the semester. Also the written evaluation shows to the teacher, that the sharing in the social network could give deepness to some concepts. The evolution of conversations and discussing about videos, files or just affirmations are also proof of students' involvement in their own knowledge.

## 4. Characterization of study case

The authors applied this model to the curricular guidelines of a subject of higher education course in Portugal. This case study aimed at examining the relationships that are created during this interaction, later to be able to lay the roots for something deeper and that could be perceived as an international network of knowledge with the backdrop of the use of social networks.

The studied group was composed by 34 students. 85.3% of them were female, percentage corresponding to 29 individuals, and 14.7%, 5 elements, were male. All of them had computer and 94.1% (32), had internet connection.

From the 34 students, 50%, 17 individuals, considered to be knowledgeable regarding the use of computers. As relates to the use of social network study, 15 elements, 4.1%, it is able to develop a good use of this tool. Yet, 2

elements don't believe in their social network abilities, classifying their ability with "bad". Still, 7 people believe they have a good performance and 1 element claims to be excellent.

This small group of students were using for an entirely semester a social network, Facebook, apart from the normal classes. The teacher were giving information and coordinating the answers from the group users, validating thoughts and interacting with them. We should say that not all the students were regular users, considering regular as a person who interacts every day minimum, but from the study, and ending of semester with the curricular evaluation, we feel that part of the results are due to the used of the social network.

The situation that we lived brought us visions of what could be another interesting teach and learning process, with the use of a social network.

## 5. HMG: Advantages and Disadvantages

One of the advantages that authors found in the use of HMG model, instead of the current models that are based on static and, especially, by placing documents in virtual platforms created as repositories documentary, is the ease of use by students. The fact that the online connection online is so high, becomes the content sharing something natural, effective and accessible anywhere and anytime. The high percentages of students who use these social networks are perfectly familiar with the various systems of the different networks. For the few who do not have frequent user experience, these software turn out to be intuitive to use, being not necessary profound explanations.

Another great advantage is, as previously mentioned, the motivational factor: the realization of a job or even clarify questions about content through any social network may arouse greater interest in the student's own task performance.

Speaking about students with special academic situations, this methodology can constitute a great support in their academic courses. Working students with schedules incompatible with academic time, students with chronic illnesses requiring successive fault or even if they are unable to attend classes, can have in this methodology an added advantage, since, more easily, are aware of the contents worked as well as subsequent analysis which can be done using the network established for the purpose. As such, HMG may contribute to the personal achievement of the individual, allowing him to be aware of what is being presented in the study of a subject and generally extend the analyses and discussions that take place in environment room, both in space and in time.

Regarding the disadvantages that might be pointed to this type of methodology refers to the fact that socialization can be affected. However, the authors cannot but remember that this is a hybrid model, not totally dismissing the classroom, continuing to assign to them the intrinsic importance, being truly indispensable to the development of each ones personality, as well as the integration of teach element in the group. Furthermore, the promotion of

group work with this method is an essential issue and must often be stimulated, this being a practical easily performed. The Educator is an essential link in HMG process.

Another possible disadvantage it would be the so called “danger” of publication personal data on Internet and the consequences that this action might entail. Actually, this did not constitute "danger", since many of the groups created within these social groups can be closed. The working group used in this experimental study was "closed", i.e., only previously selected people are allowed to be part of these groups and, as such, only these people had access to the information available in there.

In this way, it can be inferred that the use of social networks in the process of teaching proved itself a privileged tool in school-social context, being the biggest reason for such success that this tool be intrinsically linked to the daily lives of our students, as well as their personal interests, constituting therefore as a motivational element. Therefore, teaching-learning and social networking, instead of constituting dichotomous poles, present themselves as elements of an educational continuum, in which both dimensions may, according to the intentions of actors want to achieve the same goals.

## 6. Conclusion

The Internet is part of students’ lives and even themselves have already set up their space in this vast environment. Thus, they drive at the speed of technologic evolution to more flexible, interactive and timeless lifestyles making use of social networks for participation, sharing and reporting information. So, these are dimensions that are based on the pursuit of knowledge, of information, so the pedagogical perspective should be extended, allowing students an active participation in the teaching-learning process and a role as co-producers of the contents, presenting itself as a participatory, social and supportive process, regarding the interests, goals and needs of individual students (McLouchlin et al., 2007).

Being the social networks an emerging technological tool with positive results in the social field, it is assumed that its efficacy is greater when social networks start to be used actively in the educational field.

Our study case show us that the line between the use of new technologies and the teaching process it’s very small and could be diminish with the use of social networks.

Being connect everywhere, at every hour, at every minute, it’s a normal situation for the students of the future, our students!

We should always look for the best learning process, adapted to the class that we have in the present moment. For that, we need to be always aware of the large possibilities to drive the learning through different ways.

Which will be the ultimate process, which will be the optimum way to do it? There isn’t a final answer, only the will to do it as a conscientious transmitter of knowledge. Everyone should try to seek options, test it and analyse

the effects. Social networks are getting an extreme importance in our daily life, all across the world, are we capable to deal with this?

Getting to the end of this article we answer to some of the beginning questions, others not. So we left with another series of interrogations, meaning that investigation it's not always finish.

Investigating lead us to more investigation, the path is not always done, especially in the field of education.

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